tological features of the entire country for the month. Messrs. Abbe and Abbe, jr., will be the Editors.

Professor Abbe may have a short chapter each month under the caption of "Notes by the Editor," in which he will make a review of the progress of meteorological science or write about incidents thereto. An occasional article that deals with the climatology of the United States or of some portion of the world may also be included.

Each section director will report any items of special meteorological interest that may be observed in his section during the month, but all such data as giving the dates of the numerous thunderstorms and frosts and hails will be omitted unless they have a peculiar significance to the weather of the month. The Editor in writing his review of the month may refer to these if he thinks they are important.

The country will be subdivided into twelve natural climatic divisions that shall be consistent with the various watersheds, and the data will be grouped and published at this office in accordance with these new divisions.

The new publication will begin as soon as necessary arrangements can be effected. [Probably with the number for July, 1909.] * * *

Respectfully,

(Signed) WILLIS L. MOORE,
Chief U. S. Weather Bureau.

On April 1, 1909, "the Review Room and the work pertaining thereto" was transferred to the Climatological Division, and shortly afterward the following order was issued:

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU,
Washington, D. C., April 9, 1909.

Professors Abbe and Bigelow may each write reviews of, comments on, or criticisms of meteorological papers, researches or events, and publish them in the Review over his own signature. Mr. Abbe, jr., will, under the caption "Editor's Notes," and with appropriate subcaptions, briefly note the development and progress of meteorological science thruout the world, so that the Review may still mark, step by step, the development of the science without becoming a meteorological journal and without publishing extensively the details of meteorological papers.

Respectfully,

(Signed) WILLIS L. MOORE,
Chief U. S. Weather Bureau.

WEATHER WORDS IN ALL LANGUAGES.

The historical development of the study of meteorology has a very interesting side when we turn to the terms that are used by various nations. The comparison of these terms is not merely a study in comparative philology, but it throws light upon the poetical and philosophical ideas current among the respective nations. Moreover, as weather, storms, rain, and wind are common thruout the world, and every nation must have words for these simple elementary ideas, we should by means of the similarity of terms be able to infer something as to the intercourse of nations with each other, and the influence of one nation on others. A friend in New York has lately promised us a complete collection of meteorologic terms in use among the natives of various tribes that occupy nearly all the islands of the Pacific Ocean, and it is not impossible that this may throw light upon the methods by which those tribes have been dispersed thruout this aqueous half of the globe. Gov. John P. Finley, of Zamboanga, P. I. (who is also Major in the 28th Infantry, U. S. A., and was well known twenty years ago as an officer of the weather service actively interested in the study of tornadoes), has kindly furnished us with the following extensive list of names of certain meteorological terms used in the Philippines by English, Spanish, Maguindanao Moro, Sulu Moro, and Malay. The Maguindanao Moro terms are given in both English and Arabic characters, which latter we omit. We understand that the Arabic characters are used quite extensively in the Philippines, and it seems to us not unlikely that traces of old Arab terms may still survive in the extreme East. We have often stated that the term *euroclydon* which appears in Acts, Chapter XXVII, verse 14, as a Greek word, is simply a transliteration to suit the Greek taste for euphony of the Phoenician or Hebrew words *eulos krudon*, a strong wind, which itself must have been closely allied to some Arabic term. As the Phoenicians were great sailors and the Arabs equally extensive traders and travelers, we may not unreasonably expect to find other Phoenician and Arabic words transmuted into modern popular usage. To those who take an interest in philology and etymology we commend the history of words relating to the weather as a subject that is likely to throw light upon the earliest phases in the history and migrations of nations.—*C. A.*

Meteorological terms used in the Philippines, compiled by Maj. J. P. Finley.

English.	Maguindanao (Moro).	Sulu (Moro).	Spanish.	Malay.
White clouds	Gabun a maputi	Andum puti	Nubes blancas	awan puti.
Dark clouds	Gabun a maytum or (Rundung)	Gabun	Nubes obscuras	awan itam
High clouds	Gabun a mapu'u	Awan mata'as	Nubes elevadas	awan tinggi.
Low clouds	Gabun a mababa	Awan hababa'	Nubes bajas	awan randah or rendah.
Clouds	Gabun	Awan	Nubes	Awan.
Fog	Lukup	Gabun	Niebla	Kabut.
Rain	Uran	Ulan	Lluvia	Hujan.
Heat	Kayaw	Pasu	Calor	Panas.
Cold	Katinggaw	Haggut	Frio	Sejuk.
Rainbow	Bulutu or Tupung.	Inak	Arco iris	Plangi.
Storm	Rilut or Subusubu.	Humus or Unbak tawpan.	Tormenta	Rilut.
Thunder	Ruggung	Dawug-dug or Dang-dug.	Trueno	Guroh.
Lightning	Kilat	Kilat	Relampago	Kilat.
Wind	Undu'	Hangin	Viento	Angin.
Snow or hail	Uran-watu	Ulan batu	Nieve ó granizo	Thalj (Ar.).
Ice	Ig-a-watu	Tubig-batu	Hielo	Ayar baku.
Moisture	Maglasa or Musa	Basa'	Humedad	Lengas.
Current	Margus Ig	Sug	Corriente	Arus.
Kite	Layang-layang	Taguri	Cometa	Layang-layang.
Waterspout	Subu-subu	Bubawi	Manga mariua	Puting bliou.
Whirlwind	Ripurus	Ayimpus or Aimpus.	Remolino	Angin puting bliong.
Sunlight	Sigay	Sawa	Luz del Sol	Trang.
Darkness	Kalibutung	Lindom	Oscuridad	Glap.
Moon	Ulan-ulan	Bulan	Luna	Bulan.
Sun	Snang	Suga	Sol	Mata hari.
Star	Bitun	Bit'un	Estrella	Bintang.
Weather (day)	Gay	Adlaw	Tiempo	Musim.

WINTER ARIDITY INDOORS.

By Prof. M. S. W. JEFFERSON, Ypsilanti, Mich.

[Reprinted from Journal of Geography, Vol. I, No. 10, December, 1902.]

The very interesting paper by Professor Ward in the September Journal of Geography[1] suggests arithmetical treatment to show the actual quantities of water demanded in connection with a heating and ventilating plant to preserve a healthful humidity within doors in winter.

On the average of the twenty-one days of Professor Ward's observations an outside temperature of 36° F. was accompanied by a relative humidity of 71 per cent. There were present then in each cubic foot of air 1.77 grains of water vapor. This was warmed within the house to a temperature of 69° and then showed a relative humidity of 30 per cent. Corresponding to these figures is a water vapor content of 2.32 grains per cubic foot, showing an increase in the absolute amount of water present of 0.55 grain per cubic foot, which must be credited to the water pans used in connection with the heating apparatus.

To obtain what we might call a healthful humidity, of say 70 per cent at 70° F., 5.59 grains of water are needed to the cubic foot. There was a deficit of water vapor then in the room examined to the amount of 3.82 grains per cubic foot.

[1] See Monthly Weather Review, September, 1908, 36:281.

It appears, therefore, that the water pans supplied little more than one-seventh as much water as was needed for proper humidification, if the standard set of 70° F. and 70 per cent humidity be a proper one.

Knowing the quantity of air supplied per minute by a heating plant, it is a simple matter to estimate the amount of water that should be evaporated and added to air of given outside temperatures and humidities.

Clearly we are best off in winter in this respect when the outside air is saturated. Suppose an outdoor temperature of 40°. At saturation there are present 2.85 grains of water to the cubic foot. If a heater raises this air to 70° without adding to its water content, it will become drier as failing to increase its water along with its temperature. In other words, to maintain saturation at 70° F. needs 7.98 grains of water to the cubic foot, and having still but 2.85 it is said to have only $2.85 \div 7.98$, or 36 per cent [of the amount of] water [needed] to saturate it. Its relative humidity, therefore, is 36 per cent. For the 70 per cent humidity assumed as a desirable standard, we need $0.70 \times 7.98 = 5.59$ grains of water. The heating apparatus should therefore add 2.74 grains of water at the same time as it raises the temperature in order to produce the desired humidity. This additional 2.74 grains is a minimum quantity, however, since we have assumed the favorable case of saturated outer air. Had the outer air contained the average 69 per cent of Professor Ward's table, the water vapor present would have been only 0.69×2.85 or 1.97 grains per cubic foot and the additional water needed to obtain the desired humidity would be 3.62 grains. Table A gives the relative humidities that would result from raising to 70° F. without adding water, outer air at various temperatures, from 0° to 50° and relative humidities from 60 to 100 per cent.

TABLE A.—*Showing inside humidities corresponding to certain outside humidity.*

Outside humidity.	60 per cent.	80 per cent.	100 per cent.
Outside temperatures. °F.	Inside humidity. (Per cent.)		
0	4	5	6
10	6	8	10
20	9	12	16
30	14	19	24
40	21	29	36
50	31	41	51

The number of grains that should be added in each case to bring the humidity up to 70 per cent when air has been raised to 70° is given in similar form in Table B.

TABLE B.—*Amount of water required to bring inside humility to 70 per cent when the temperature is raised to 70°F.*

Outside humidity.	60 per cent.	80 per cent.	100 per cent.
Outside temperatures. °F.	Grains of water. (Cubic foot.)		
0	5.30	5.21	5.11
10	5.12	4.97	4.81
20	4.85	4.60	4.35
30	4.43	4.04	3.65
40	3.88	3.31	2.74
50	3.14	2.33	1.51

This table is a somewhat precise expression of the fact that the drier and colder the air outside, the more intense and unwholesome the indoor aridity that results from heating air without humidifying it, and the greater the demand on any humidifying arrangement for water to compensate the effect of raised temperature. According to Chamber's Encyclopedia, "Ventilation" requires a supply of 20 to 30 cubic feet of air per minute per individual. Let us say 25 cubic feet per minute or 36,000 per day of twenty-four hours. To find the daily need of water corresponding to that air supply per individual, we multiply the grains per cubic foot of Table B by 36,000, and divide by 14,600, the number of grains to a quart, giving us Table C with quarts of water per day per individual needed to correct the aridity of air that has been raised to 70° from the outside conditions tabulated.

TABLE C.—*Daily amount of water, per individual, required to correct the aridity of air raised to 70°F.*

Outside humidity.	60 per cent.	80 per cent.	100 per cent.
Outside temperatures. °F.	Quarts per day.		
0	13.7	12.8	12.6
10	12.6	12.2	11.9
20	12.0	11.3	10.7
30	10.9	10.0	9.0
40	9.6	8.2	6.8
50	7.7	5.8	3.7

From Table C it appears that under the average conditions of Professor Ward's twenty-one days, about 2 gallons of water per individual should be evaporated to humidify his daily supply of air. A family of 5 persons would need 10 gallons of water evaporated daily for the same purpose, and a schoolhouse 200 gallons of water daily per 100 pupils. If the air supply assumed at 25 cubic feet per minute be not an actual quantity, it is simple to assign the proper proportionate value for any known rate of air supply. We might cut down a school supply by reducing the hours allowed for daily use from 24 to 9, corresponding to a drop from 200 gallons per 100 pupils to 75 gallons daily. On the other hand, Professor Ward's instructive observations were far from approaching the extremes met any winter in American houses, as his coldest outside temperature mentioned is 23° and least outside humidity 51 per cent. From Table A we learn that zero temperatures with a humidity of 60 per cent means an inside humidity of 4 per cent if the air is raised to 70°F. without additional water. Even adding the maximum amount supplied by Professor Ward's water pans in any day (November 11), 1.18 grains, we yet have a relative humidity of only 18.4 per cent. If it is true that a cold spell makes it hard to keep up to 70°, it is also true that we suffer in the defect of temperature, and also the outer air may commonly have a humidity far below 60 per cent. W. M. Davis says (Meteorology, p. 145) we may have as low as 30 per cent in our winters. Ultra-desert conditions undoubtedly occur within doors every winter.

HONESTY THE BEST POLICY.

In his address on earthquake forecasts[1] before the American Association of Geographers at Baltimore, January 1, 1909, Dr. G. K. Gilbert touches on a question that has been discust before in these columns, viz, the disadvantages in connection with the attempted concealment of dangers from natural phenomena. His remarks apply equally well to meteorological as to earthquake phenomena.

The proposition that it should be the policy of the inhabitants of an earthquake district to recognize the danger and make provision for it appears self-evident, but I regret to say that its soundness is not universally recognized in California.

* * * * * * *

This policy of assumed indifference, which is probably not shared by any other earthquake district in the world, has continued to the present time and is accompanied by a policy of concealment. It is feared that if the ground of California has a reputation for instability, the flow of immigration will be checked, capital will go elsewhere, and business activity will be impaired. Under the influence of this fear, a scientific report on the earthquake of 1868 was suppressed. When the organization of the Seismological Society was under consideration, there were business men who discouraged the idea, because it would give undesirable publicity to the subject of earthquakes. Pains are taken to speak of the disaster of 1906 as a conflagration, and so far as possible the fact is ignored that the conflagration was caused, and its extinguishment prevented, by injuries due to the earthquake. During the period of aftershocks, it was the common practise of the San Francisco dailies to publish telegraphic accounts of small tremors perceived in the eastern part of the United States, but omit mention of stronger shocks in the city

[1] See Science, 1909, 29 (N. S.): 135-6.